UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

JUN 03 2010

Mr. David Keith
Project Coordinator
Anchor QEA
2113 Government Street
Building D, Suite 3
Ocean Springs, MS 39654

RE: Comments on Draft RI/FS Work Plan and SLERA
San Jacinto River Waste Pits Superfund Site

Dear Mr. Keith:

The U.S. Environmental Protection Agency (EPA) has completed its review of the *Draft Remedial Investigation/Feasibility Study Work Plan*, including *Appendix B: Draft Screening Level Ecological Risk Assessment* (dated April 2010) for the San Jacinto River Waste Pits Superfund Site.

Enclosed with this letter are EPA review comments for the purpose of the Unilateral Administrative Order for Remedial Investigation/Feasibility Study for this site.

Please address each review comment and feel free to contact me at (214) 665-8409, or by email at tzhone.stephen@epa.gov, if there are any questions or comments.

Sincerely,

Stephen L. Tzhone
Remedial Project Manager

Enclosure

cc: Ms. Ludmila Voskov, TCEQ
Ms. Jessica White, NOAA
Ms. Herminia Palacio, HC

633911

EPA Comments for Draft RI/FS Work Plan & SLERA (dated April 2010)

1. Please see the redline/strikeout version of the Draft RI/FS Work Plan and address each edit.

2. Section 4.2, Section 6.3: Add language ensuring that biological receptors, associated with the current fish consumption advisories identified in Section 2.3.7.5., is included in both the Human Health Site Conceptual Model and the Baseline Human Health Risk Assessment

3. Section 8, RI/FS Schedule: Add language ensuring that an updated RI/FS schedule is included with every monthly progress report submittal.

4. Figures 2-1, B-2: CSM and data gaps sections refer to an Upland Sand Separation area to be included in soil data collection. This area, south of the bridge, needs to be sampled as there is evidence that the first pits were located there and that those pits drained into the river.

5. Figure 4-1: Benthic macroinvertebrates – surface water exposure pathway is deemed incomplete. This is incorrect. Benthic macroinvertebrates are certainly exposed to surface water, especially if they build lined tubes (Leptocheirus plumuslosus) of siphon (mussels) water.

6. Figures 4-1, 4-4: If the fisher is exposed to sediment, then they are also exposed to porewater by direct contact. The two cannot be separated. This pathway is complete. The same applies for mammals. If they are exposed to sediment then they are also exposed to porewater.

7. Figure 4-3: This figure must be y-axis log-scaled so the figure reflects points near 100.

8. Figures 4-5, 4-6, B-6: These figures reflect mammals coming into direct contact with sediments. As such they also come into direct contact with porewater and this needs to be reflected in the figures.

9. Figures 4-5, 4-6, B-6: Footnote "b" states the assumption that birds and mammals do not ingest surface water because it is estuarine; however, the diagram shows complete pathway for birds. Complete pathway for wading birds is the correct assumption (diagram) regardless of salinity.

10. Figures 4-5, 4-6, B-6: Benthic macroinvertebrates and fish do ingest surface water, therefore, these should be shown as complete pathways. It's not just respiration. When fish eat, they ingest water. This is why freshwater and salt water fish have opposite mechanisms for ridding or conserving body salt concentrations.

11. The following issues needs to be resolved within the RI/FS Work Plan or in the upcoming technical memorandums:

    - No models are specified for evaluating particle transport and settling, including resuspension.
    - No test methods are proposed for any clean sediment that may result from the hydrocyclone (can this sediment serve as beneficial use?).
    - The air pathway seems to be absent during the FS alternatives evaluation. For example: no volatilization evaluation is proposed for the CDF alternative; yet if a CDF is constructed, in-situ or mechanical dewatering methods will release volatile compounds.
    - The disposal option may want to consider geosorbents as possible components.

12. Section 2.2.5, Geology, pages 15-17, Second paragraph: Reference to Figure 2-6 is not correct. The cross-section is shown on Figure 2-7. Additionally, this cross-section is not accurate based on the Table 2, Sediment Characteristics Data, from the TXDOT (Weston) Sediment Sampling Report, San Jacinto River Bridge Dolphin Project, dated 2006. For example, according to Table 2, for deep boring D1 there is a sand layer in the 18-20 foot depth interval. There are other inconsistencies between the Table 2 data and the cross-section interpretation as presented in Figure 2-7. The cross-section needs to be corrected to reflect laboratory sediment characteristic data from Table 2, which is more reliable than a subjective visual field observation. As corrected, the cross-section will show a typical sequence of interbedded and interfingered fluvio-deltaic sands, silty sands, silts, clayey silts, silty clays, and clay layers. As corrected, a cross-section such as this will also illustrate a strong possibility for vertical and horizontal movement of contaminants from the Site into the upper portion of the Chicot aquifer.

13. Section 2.2.5, Geology, pages 15-17, Second paragraph: The text and Table 2-2 described three groundwater wells which are within 3,000 feet east and southeast of impoundments. These wells are used for public water supply and are completed in a relatively shallow Upper and Lower Chicot formation. The wells are downgradient from the Site according to the general groundwater flow direction. The investigation should incorporate water quality data for these wells, including the data related to the site contaminants.

14. Section 3, Assessment of Data Quality and Usability, Page 48: Regarding historical data relevant to the Remedial Investigation (RI) process, data quality reviews were performed to ensure such data are used appropriately during the RI process. The vast majority of such data was classified as Category 2, generally viewed as of unknown or of suspect quality. It is unclear from the text if the needed QA/QC data is not available, is suspect, or was not contained in the documentation available to the Respondents. Considering the potential value of the historical sediment, surface water, and tissue data to RI modeling efforts on both fate and transport and bioaccumulation, additional effort is warranted to conclusively classify existing data by obtaining the relevant QA/QC information, particularly that generated by the TCEQ TMDL program. This will likely entail independently obtaining the needed information directly from the contractor files.

15. Section 4, Conceptual Site Model (CSM), Page 52: The text (Section 4.1.1) notes the work of Louchouarn and Brinkmeyer, 2009, regarding locations with very high dioxin levels, such as at the impoundment. Such conditions exceed the sorption capacity of sediments potentially resulting in high levels of dissolved dioxins partitioning to the water column. Future work on fate and transport issues must consider the extended time period that surface waters have been in contact with pulp mill waste, including within the impoundments. This is in addition to evaluation of the partition dynamics between affected sediments and the water column.

16. Based on aerial photographs, TCEQ notes that the impoundments have been at least partially submerged in the San Jacinto River for approximately 37 years and remain so. Given that the San Jacinto River provides about 28% of the freshwater inflow to the Galveston Bay system, it is apparent that such partitioning from pulp mill waste to the water column has the potential to represent significant loading to the system and result in a spatial distribution within both water and tissue that is significantly different than the sediment fingerprinting results of Louchouarn and Brinkmeyer, 2009. The Respondents should provide text indicating that the RI process will evaluate this transport scenario. Furthermore, Figure 4-2 (Physical/ Chemical Fate and Transport Processes) should be revised to show pulp mill waste in direct contact with surface waters.

17. Section 4.1.2, Dioxin and Furan Toxicity, page 56 and Table 4-1: Toxicity equivalency factors (TEFs) for dioxins and furans are presented. However, only the 17 dioxin and furan congeners with dioxin-like toxicity are listed. The Texas Risk Reduction Rule TAC§350.76(d)(2)(B) states "Further, when congener

concentrations are available, the contribution of dioxin-like polychlorinated biphenyls to total dioxin equivalents shall be considered." Please clarify whether new data will be analyzed for congeners since congener data are available for sites outside of the impoundment.

18. Table 4-1, Toxicity Equivalency Factors for Dioxins and Furans: Mammalian TEFs, Avian TEFs, and Fish TEFs all have a reference letter, either a or b. However, there are no footnotes for these references in the Notes section for this figure. Also, it is unclear if "mammalian" includes humans.

19. Section 4.2, Human Health Site Conceptual Model, page 60: Figures 4-4 and 4-5 are referred to in this section. It is stated that Figure 4-4 is a simple CSM of the release and exposure pathways and that Figure 4-5 presents a CSM exposure diagram for human receptors. However, it appears that Figure 4-4 is the human receptor CSM, Figure 4-5 is the ecological receptor CSM, and Figure 4-1 is the overall CSM.

20. Section 4.2.1, Human Health Receptors, page 60: It is stated that three potential receptors have been identified for evaluation in the BHHRA: a fisher, a recreational visitor, and a trespasser. As noted in the comments on the Draft Sediment SAP (comment on Figure 6), a distinction needs to be made between the recreational and subsistence fisher pathways. Fish ingestion rates differ between these two pathways and both pathways should be considered.

21. Figure 4-4, Conceptual Site Model for Human Health: The fisher exposure to pore water with dermal contact is considered an incomplete pathway. It is unclear why this would be considered an incomplete pathway while the recreational visitor and trespassers are considered complete.

22. Section 4.2.2, Human Health Exposure Pathways, page 61: Due to the lack of information on the Site's groundwater chemistry, an additional potential exposure route should be included for off-site groundwater ingestion. Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (PCDD/Fs) are hydrophobic organic substances which strongly adsorb to soil particles. Once adsorbed, they are believed to be virtually immobile. However, research in the last decades has confirmed that strong sorbing contaminants may reach the groundwater via colloid-facilitated transport.

23. Section 4.2.2, Human Health Exposure Pathways, page 61: Figure 4-5 indicates that consumption of fish by recreational visitors is the only incomplete exposure pathway identified. The figure being referred to appears to be Figure 4-4 rather than Figure 4-5. Also, in Figure 4-1 and 4-4 the fisher dermal exposure to pore water is considered incomplete, and in Figure 4-1, only the recreational visitor exposure to surface water is considered incomplete.

24. Section 4.3 Ecological Site Conceptual Model, Page 61: TCEQ recommends an additional mammalian measurement receptor is necessary to adequately characterize risk in the BERA; specifically, the marsh rice rat should be included due to its likely presence, moderate body weight, and partially carnivorous diet. We note that their diet includes fiddler crabs, fish, and clams.

25. Section 5, Study Elements and Data Needs, page 64: Study Elements 1 through 3 need to include groundwater for consideration.

26. Figures 4-1 and 4-2: Groundwater needs to be included in the exposure media and the physical/chemical fate and transport processes.

27. Figures 4-4, 4-5, and 4-6: Groundwater needs to be included as a separate exposure media.

28. Section 5.2.2, Sediment Data Gaps, page 68: PCBs are not mentioned in this section as being part of the primary COPCs, even though they are clearly identified as a primary COPC elsewhere. It is also stated

that sediment data within the impoundments are extensive; however, as stated in the Sediment SAP and in Appendix C, PCB congener data are not available for sediment data within the impoundments, which is why they are being collected and analyzed. Therefore, it is unclear if this is viewed as a data gap. Also, please clarify whether future samples will be analyzed for PCB congeners.

29. Section 5.2.3, Water Data Gaps, page 69: It is stated that human exposures via water are considered negligible because people are not expected to ingest substantial quantities of water from the Site. This is a known swimming and recreational area. In the Texas Risk Reduction Rule TAC§350.71(c) it states "The person shall develop PCLs for each of the following human health exposure pathways which are complete or reasonably anticipated to be complete."

30. Section 5.2.4, Tissue Data Gaps, page 69: While it is realized that more details will be provided in the Tissue SAP, please be aware that one main objective of cleanup of the Site is to remove the fishing advisories that provide protection of the consumption of edible fish and shellfish by humans. Therefore, tissue samples should include the species representative of those advisories for this area: catfish and blue crab.

31. Section 6.1.2 Surface Water Investigation, Page 79: The discussion indicates that if the analysis of sediment and tissue data from the Site indicates that potential risks are not adequately explained by sediment exposures, then the chemical fate and transport model will be used with partitioning parameters to predict dissolved concentrations of COPCs. The text goes on to state that if large uncertainties in risk assessment results are due to the use of these estimates, then confirmatory sampling of water quality conditions may be considered in a future phase of site investigation. The Respondents may also want to consider collection of sediment pore water samples in and adjacent to the pits to evaluate dissolved dioxin/furans in the pore water as an exposure medium and source medium (for releases to the water column).

32. Section 6.1.3.1 Tissue Sampling and Analysis, Page 80: Sediment ingestion is indicated as a minor pathway for omnivorous fish (Fig 4-6). The Respondents may want to consider collection of striped mullet (Mugil cephalus). Although these fish do migrate, they are important forage fish along the Gulf Coast and sediment exposure is maximized since adults commonly feed by sucking up the top layer of sediment.

33. Section 6.1.3.1 Tissue Sampling and Analysis, Page 80: Text should state the intent to analyze tissue samples for PCB congeners, in order to determine total dose to compounds with dioxin-like toxicity in the BERA (EPA, 2008).

34. Section 6.4 Baseline Ecological Risk Assessment, Page 102: Please clarify if a BERA Workplan will be part of the RI process.

35. Section 6.4.3.1 Aquatic Life, Page 106: The discussion indicates that to evaluate exposure of fish through ingestion, concentrations of COPCs in each ingested medium (food and sediment) will be compared to the toxicity reference value (TRVs) expressed as dietary concentrations (mg/kg diet). The TCEQ is primarily aware of effect levels for fish in terms of residue levels. How will TRVs (as dietary concentrations) be derived for fish?

36. Section 6.4.3.2 Aquatic-dependent Wildlife, Page 106: Please define, "UCR" as depicted on page 107.

37. Section 6.4.4 Measures of Effects, Page 108: The TCEQ recommends avian receptors be evaluated using both a total dose Hazard Quotient approach and the proposed egg critical tissue residue approach.

38. Section 6.4.4 Measures of Effects, Page 108: Text recommends sole reliance on the critical tissue residue approach to evaluate effects on fish from dioxin exposure. The TCEQ recommends an additional line of evidence be included in the form of toxicity tests that evaluate early life stage effects on fish from dioxin exposure. For example, the EPA Region 6 Calcasieu Estuary BERA performed 48-hour sediment pore water toxicity tests with redfish (Sciaenops ocellatus) embryos based on an endpoint of hatching success and survival.

39. Section 6.4.5.4 Characterization of Background Risks, Page 113: Text states background ecological risks will be characterized based on both upstream and regional conditions, as determined to be necessary based on risk characterization results. Previous comments have provided TCEQ concerns regarding the potential for upstream sediment and tissue to have been affected by the Site. Regarding the use of regional background, the area fishery is currently subject to a fish consumption advisory and multiple regulatory programs are attempting to lower tissue concentrations. These factors indicate development of a regional background concept within the affected area will be of limited value in determining the need for remedial action or protectiveness of current conditions. Also, the full extent of the area impacted by the Site is undetermined; the spatial effects of site contaminants to the water column and tissue are expected to be distinctly different than that of sediment, and will need to be considered in determining appropriate use of background. Text should be revised to reflect these realities.

40. SLERA Section 3.2.1 Benthic Macroinvertebrates, Page B-25: The discussion on page B-25 states that dioxins and furans will be considered in the evaluation of risks to benthic macroinvertebrates in the BERA based on the information provided in Attachment B2 to this SLERA. Table B-4 should be revised to indicate that dioxins and furans will be retained as a COPC for benthic invertebrate community.

41. SLERA Attachment B1 - Species That May Be Expected in the Vicinity of the San Jacinto River Waste Pits Site: Looking at the attached tables, a number of state or federally listed threatened or endangered wildlife species could occur in the vicinity of the Site. The Respondents will need to determine if these species could occur at the Site, based on the habitat needs of the receptor. If the receptor cannot be ruled out, the BERA should designate a surrogate species for the protected species and base any hazard quotient calculations or risk characterization on the NOAEL TRV or equivalent.

42. The RI/FS Work Plan should consider all appropriate removal actions and remediation solutions with equal weight and not be slanted toward use of a Confined Disposal Facility (CDF). Alternatives such as excavation and off-site disposal of the source waste fill need to be addressed more fully. This comment relates to Section 1.2.1 - Site Management, Section 5.4 - Study Element 4: Engineering Design Evaluation, Section 6.1.1 – Sediment, and Section 7.6.4 -Disposal Technologies.

43. The evaluation of remedies should consider applicable federal requirements such as flood impacts of any proposed structure (if a structure that blocks additional flow area of the river is selected) as well as the stability of the I-10 bridge (if additional scour is introduced by a restriction of the upstream flow area caused by a remedy).

44. The RI/FS Work Plan does not address the following two sites that should be incorporated into this plan:

    - As per an interoffice memo of the State Health Department concerning an investigation conducted on April 22, 1966, the same waste as contained in the SJRWPSS was also deposited in a pit located south of the Superfund Site. As this waste fill may represent a similar threat to the human health and the environment and was the waste generated by Champion Paper Company, this location should also be investigated for inclusion in the scope of this RI/FS Work Plan. This location is currently described as Tract 4J of Abstract 330 of the J.T. Harrell Survey.

- As indicated by review of aerial photos, some type of pit excavation and filling occurred on what is now described as Tracts 4F and 4F-1 of Abstract 330 of the J.T. Harrell Survey. A pit appears to be under excavation as indicated in a 1964 aerial photo, and from additional aerial photos, was filled between 1966 and 1969, with possible additional filling between 1969 and 1973.

45. The report cited as Louchouarn and Brinkmeyer (2009), is a study on Phase I of a multi-year study designed to examine the sequestrations and microbial degradation of dioxins in the Houston Ship Channel/Galveston Bay (HSC/GB) system. The conclusions of this report on page 13 ends with the following statement:

    'Although this work is based on empirical sorption coefficients that are relevant to the environment of study, accurate porewater concentrations (and thus bioaccumulation potential) need to be measured directly before any meaningful risk assessment and remediation strategy are to be devised.'

    Thus, reliance on this source should be tempered with this limitation and cited only when appropriate. In particular, the statements attributed to this cited report in Section 4.1.1 Page 54, Section 4.1.3, Page 58, and Section 6.1.2, Page 79 should be revised recognizing this limitation.

46. Section 2.1, Page 10, Site History. This section omits a critical fact regarding discharges of waste from the Site. A sentence should be added to this paragraph to the effect that some waste was pumped from the Site into the San Jacinto River as noted in a letter to MIMC from the Harris County Health Unit dated December 28, 1965.

47. Section 2.1, Page 10, Site History. This section describes the Site as having "*late successional stage estuarine riparian vegetation*." During a Site visit, the Site seemed dominated by hackberry trees which are often considered pioneer or early successional stage trees in this portion of the State of Texas. The basis for the characterization of the Site as having vegetation characteristic of a late successional stage should be validated to verify this description. This description is also used in Section 2.2.2.

48. Section 2.2.3, Page 13, Land Use. This section states: "*There are three registered point sources of dioxins and furans upstream of the Site on the San Jacinto River and one immediately downstream (Figure 2-4: Table 2-1).*" It is not clear what references are used for these registrations. Defining other sources of dioxins and furans is an important part of this study and the other sources need to be carefully defined with supporting documentation.

49. Section 2.2.7, Page 18, Surface Water Use. This section states in the first paragraph, "*Fish consumption in the San Jacinto River, both up and downstream of the Site is restricted . . . .*" The language in the RI/FS Work Plan suggests that there is some governmental agency which is patrolling the area to dissuade fish consumption. Harris County requests that this language be clarified to convey that the Texas Department of State Health Services places fish advisories recommending limiting fish consumption. However, fish consumption is only restricted by the amount that local fishers can catch. To date, the only action undertaken to restrict fishing has been advisory signage and the recent addition of a fence along a portion of the shoreline.

50. Section 2.2.7, Page 18, Surface Water Use. This section focus only on water use designation which does not let the whole story. Table 2-3 is not helpful because it does not use terminology common to Clean Water Act and it oversimplifies by not showing where the impaired segments (assessment units) are located (especially as related to the Site). Words such as suitable, unsuitable, approved or restricted should be replaced with impaired or designated where appropriate. The focus also should be on impairments specific to the segments affecting the site (i.e. not contact recreation in unrelated segments).

51. Section 2.3.2, Page 24, Sediment. Fourth paragraph references a county wastewater treatment facility. Harris County, the governmental entity, does not own or operate this facility. Please properly identify the owner of this wastewater treatment facility.

52. Section 2.3.2 Page 25, Sediment. In this section is the statement:

    "Tidal dispersion may lead to some upstream transport and mixing, but the aggregate downstream movement of the sediment in the San Jacinto River system appears to limit the potential influence of downstream sediments on conditions within the Site (Louchouarn and Brinkmeyer 2009)."

    This statement does not appear to be supported by the cited report. Please verify and revise as needed.

53. Table 2-1 - Highlands Acid Pit is listed in this table as a source of dioxin and furans. According to Site description posted on the EPA website summary, these are not listed as primary contaminants. Please verify the presence of dioxins and furans from the Highlands Acid Pit with documentation.

54. Section 2.3.7.1 Page 30, Louchouarn and Brinkmeyer (2009). The second paragraph cites conclusions based on the Phase I report of Louchouarn and Brinkmeyer (2009). This cite uses stronger language than the report does. Similarly, the final paragraph in this section uses stronger language than the report. Please adjust the cites to match the level of confidence expressed in the report cited.

55. Section 2.3.7.6 Page 37, Summary. The first bullet ends with a statement that is not conditioned as the report cited. This conclusion was based on modeling and was stated in the report with less certainty as the cite. Please adjust the cite to match the level of confidence expressed in the report cited.

56. Section 2.6.1, Page 45, Historical Context. Fifth paragraph refers to the "*present town of Lynchburg*." The town of Lynchburg was the victim of subsidence and no longer exists as such. Please correct this reference in the document.

57. Section 4.1.4 Page 59, Global and Regional Dioxin and Furan Sources, Release Mechanisms, and Transport Pathways. The University of Houston and Parsons 2006 report and conclusions should be considered for inclusion and be cited in this section.

58. Section 4.2.1, Page 60, Human Health Receptors. The first paragraph in this section states "*Fishers include children or adults who consume fish from within the Site boundaries either by boat or from along the riverbanks*." Please include wading as a means of harvesting fish and shellfish in this section and revise the associated Figure 4–4 for potentially complete and significant exposure pathway for Fishers to surface water through dermal contact.

59. Section 6.1.1, Page 76, Sediment. A large portion of the submerged areas around the Site are areas of sediment deposition from the San Jacinto River. As such, surface sampling of sediments may only sample relatively recent deposits of soils from upstream and not collect historical contamination associated with the Site and core sampling would be needed to verify the character of sediments in this area. In the current sediment sampling plan, core samples are planned to characterize contamination in some of the depositional portions of the San Jacinto River as indicated in Figure 14 of the Final Sediment Sampling and Analysis Plan (SAP) (and Section 2.1, third bullet in the text of the SAP). We recognize that this SAP as a phased approach to detecting contaminants and recommend that if the current plan of core samples in this depositional area detects chemicals of interest (COIs) or chemicals of potential concern (COPCs), that the following locations (illustrated in Figure 14 of the SAP) also be core sampled: SJNE034, SJNE044, SJNE045, SJNE036 and SJNE024.

60. Section 6.1.3, Page 80, Biota Investigation. We look forward to commenting on the Tissue SAP as referenced in this section; however, our preliminary comments are that the list of species to be collected needs to include a comprehensive list of fatty fish that are consumed by Fishers as well as those with consumption advisories.

61. Section 6.2, Page 88, PRG Development. We agree with using upstream data for preliminary remediation goals; however, due to tidal influence and storm surges since the Site was developed, careful consideration should be given to the upstream sample point(s).